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Application No.	09/885,609	Prepared by	NPB
Examiner-GAU	NELMS-288	Date	2/26/04
		No. of queries	2
		Tracking Number	05883815
		Week Date	1/5/04
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JACKET			
a. Serial No.	f. Foreign Priority	k. Print Claim(s)	p. PTO-1449
b. Applicant(s)	g. Disclaimer	l. Print Fig.	q. PTOL-85b
c. Continuing Data	h. Microfiche Appendix	m. Searched Column	r. Abstract
d. PCT	i. Title	n. PTO-270/328	s. Sheets/Figs
e. Domestic Priority	j. Claims Allowed	o. PTO-892	t. Other

SPECIFICATION	MESSAGE
a. Page Missing	<p>① PTO-1449 forms (10 pages): Please either initial or line through citations. (copy provided for reference).</p> <p>② there are two(2) claim 28's in the text. please advise/renumber the claims in the index of claims and text, if necessary.</p> <p><i>Thompson</i></p> <p>initials <i>Onib</i></p>
b. Text Continuity	
c. Holes through Data	
d. Other Missing Text	
e. Illegible Text	
f. Duplicate Text	
g. Brief Description	
h. Sequence Listing	
i. Appendix	
j. Amendments	
k. Other	
<b>CLAIMS</b>	
a. Claim(s) Missing	<b>RESPONSE</b>
b. Improper Dependency	
c. Duplicate Numbers	
d. Incorrect Numbering	
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f. Punctuation	
g. Amendments	
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k. Other	
initials	

U.S. Department of Commerce, Patent and Trademark Office (PTO Form 1449 modified)		Docket No. AMAT/5351/CPI/L/B/ PJS	Serial No. 09/885,609
<b>SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>		Applicant Mak, et al.	Confirmation No.: 5337
(Use several sheets if necessary)		Filing Date June 20, 2001	Group 2818
Examiner Renee R. Berry			

**U.S. Patent Documents**

*Examiner Initial		Document Number	Issue Date	Applicant(s) Name	Class	Subclass	Filing Date If Appropriate
	A1	6,139,700	10-31-2000	Kang, et al.	204	192.17	09-30-1998
	A2						
	A3						
	A4						
	A5						
	A6						
	A7						
	A8						
	A9						
	A10						
	A11						
	A12						
	A13						

**Foreign Patent Documents**

*Examiner Initial		Document Number	Date	Country	Class	Subclass	Translation	
							YES	NO
	B1						<input type="checkbox"/>	<input type="checkbox"/>
	B2						<input type="checkbox"/>	<input type="checkbox"/>
	B3						<input type="checkbox"/>	<input type="checkbox"/>

**OTHER ART**

*Examiner Initial		Including Author, Title, Date, Pertinent Pages, Etc.
	C1	PCT International Search Report from International Application No. PCT/US02/19481, Dated 08 January 2003.
	C2	
	C3	

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Date Considered

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	A1	6,481,945	11-19-2002	Hasper, et al.	414	217	06-04-1999
	A2	6,478,872	11-12-2002	Chae, et al.	117	88	12-20-1999
	A3	6,447,607	09-10-2002	Soininen, et al.	117	200	12-27-2000
	A4	6,231,672	05-15-2001	Choi, et al.	118	715	05-18-1999
	A5	6,183,563	02-06-2001	Choi, et al.	118	715	05-18-1999
	A6	2002/0134307	09-26-2002	Choi	118	715	11-30-2000
	A7	2002/0108570	08-15-2002	Lindfors	118	715	04-16-2001
	A8	2002/0094689	07-18-2002	Park	438	694	03-07-2002
	A9	2002/0092471	07-18-2002	Kang, et al.	118	715	01-16-2002
	A10	2002/0086106	07-04-2002	Park, et al.	427	248.1	11-07-2001
	A11	2002/0041931	04-11-2002	Suntola, et al.	427	255.28	05-14-2001
	A12	2002/0007790	01-24-2002	Park	118	715	05-03-2001
	A13	2002/0000196	01-03-2002	Park	118	715	05-03-2001

## Foreign Patent Documents

*Examiner Initial		Document Number	Date	Country	Class	Subclass	Translation	
							YES	NO
	B1	EP 1 167 569 ✓	01-02-2002	EP	C23C	16/455		X
	B2	WO 02/08488 ✓	01-31-2002	WIPO	C23C	16/44		X
	B3	WO 01/17692 ✓	03-15-2001	WIPO	B05C	11/00		X
	B4	WO 99/65064 ✓	12-16-1999	WIPO	H01L	21/00		X

## OTHER ART

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	A14	2002/0052097	05-02-2002	Park	438	507	05-03-2001
	A15	2001/0054377	12-27-2001	Lindfors, et al.	117	104	04-16-2001
	A16	2001/0042523	11-22-2001	Kesala	122	6.6	05-14-2001
	A17	2001/0014371	08-16-2001	Kilpi	427	255.28	12-27-2000
	A18	2001/0013312	08-16-2001	Soininen, et al.	117	86	12-27-2000
	A19	2001/0009140	07-26-2001	Bondestam, et al.	118	725	01-25-2001
	A20						
	A21						
	A22						
	A23						
	A24						
	A25						
	A26						

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## Foreign Patent Documents

*Examiner Initial		Document Number	Date	Country	Class	Subclass	Translation	
							YES	NO
	B5							
	B6							
	B7							

## OTHER ART

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	C3	
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# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet

1

of

2

Application Number

09/885,609

Filing Date

06/20/2001

**First Named Inventor**

Mak et al.

Group Art Unit

2812

Examiner Name

unassigned

Attorney Docket Number

5351/AMI-00-12

## U.S. PATENT DOCUMENTS

[illegible]

## FOREIGN PATENT DOCUMENTS

[illegible]

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**First Named Inventor**

Mak et al.

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Examiner Name

unassigned

Attorney Docket Number

5351/AMI-00-12

## OTHER PRIOR ART - NON-PATENT LITERATURE DOCUMENTS

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**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

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Sheet

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of

4

<b>Application Number</b>	09/885,609
<b>Filing Date</b>	06/20/2001
<b>First Named Inventor</b>	Mak et al.
<b>Group Art Unit</b>	2812
<b>Examiner Name</b>	Unassigned
<b>Attorney Docket Number</b>	5351/AMI-00-12

Examiner Initials*	Cite No. <sup>1</sup>	U.S. Patent Document		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-Y,YY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number	Kind Code* (if known)			
	AI	4,058,430		Suntola et al.	11-15-1977	
	AJ	4,389,973		Suntola et al.	06-28-1983	
	AK	4,413,022		Suntola et al.	11-01-1983	
	AL	4,767,494		Kobayashi et al.	08-30-1988	
	AM	4,806,321		Nishizawa et al.	02-21-1989	
	AN	4,840,921		Matsumoto	06-20-1989	
	AO	4,845,049		Sunakawa	07-04-1989	
	AP	4,859,627		Sunakawa	08-22-1989	
	AQ	4,861,417		Mochizuki et al.	08-29-1989	
	AR	4,876,218		Pessa et al.	10-24-1989	
	AS	4,993,357		Scholz	02-19-1991	
	AT	5,082,798		Arimoto	01-21-1992	
	AU	5,130,269		Kitahara et al.	07-14-1992	
	AV	5,166,092		Mochizuki et al.	11-24-1992	
	AW	5,225,366		Yoder	07-06-1993	
	AX	5,250,148		Nishizawa et al.	10-05-1993	
	AY	5,256,244		Ackerman	10-26-1993	
	AZ	5,270,247		Sakuma et al.	12-14-1993	
	BA	5,278,435		Van Hove et al.	01-11-1994	
	BB	5,281,274		Yoder	01-25-1994	

[illegible]

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<sup>1</sup>Unique citation designation number. <sup>2</sup>See attached Kinds of U.S. Patent Documents. <sup>3</sup>Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup>For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup>Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup>Applicant is to place a check mark here if English language translation is attached.

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# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet	2	of	4
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Application Number	09/885,609
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09/885.609

<b>Filing Date</b>	06/20/2001
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06/20/2001

<b>First Named Inventor</b>	Alfred W. Mak
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Alfred W. Mak

Group Art Unit	2812
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2812

Examiner Name	Unassigned
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Unassigned

Attorney Docket Number	5351/AMI-00-12
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5351/AMI-00-12

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		Number	Kind Code <sup>2</sup> (if known)			
	BC	5,290,748		Knuutila et al.	03-01-1994	
	BD	5,294,286		Nishizawa et al.	03-15-1994	
	BE	5,300,186		Kitahara et al.	04-05-1994	
	BF	5,315,793		Wallace et al.	05-31-1994	
	BG	5,330,610		Eres et al.	07-19-1994	
	BH	5,335,324		Stall et al.	08-09-1994	
	BI	5,338,389		Nishizawa et al.	08-16-1994	
	BJ	5,374,570		Nasu et al.	12-20-1994	
	BK	5,395,791		Cheng et al.	03-07-1995	
	BL	5,443,033		Nishizawa et al.	08-22-1995	
	BM	5,443,647		Aucon et al.	08-22-1995	
	BN	5,458,084		Thorne et al.	10-17-1995	
	BO	5,480,818		Matsumoto et al.	01-02-1996	
	BP	5,484,664		Kitihara et al.	01-16-1996	
	BQ	5,483,919		Yokoyama et al.	01-16-1996	
	BR	5,532,511		Nishizawa et al.	07-02-1996	
	BS	5,637,530		Gaines et al.	06-10-1997	
	BT	5,693,139		Nishizawa et al.	12-02-1997	
	BU	5,705,224		Murota et al.	01-06-1998	
	BV	5,711,811		Suntola et al.	01-27-1998	

## FOREIGN PATENT DOCUMENTS

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Sheet	3	of	4
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Filing Date	06/30/2001
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<b>Filing Date</b>	06/20/2001
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<b>First Named Inventor</b>	Alfred W. Mak
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Group Art Unit	2812
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Examiner Name	Unassigned
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Attorney Docket Number	5351/AMI-00-12
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## U.S. PATENT DOCUMENTS

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<b>First Named Inventor</b>	Alfred W. Mak
<b>Group Art Unit</b>	2812
<b>Examiner Name</b>	Unknown
<b>Attorney Docket Number</b>	5351/AMI-00-12

(use as many sheets as necessary)

Sheet	4	of	4
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## OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS

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26. (Withdrawn) A method for forming a ~~metal-contact~~ stacked barrier layer on a substrate surface, comprising:

    exposing the substrate surface to a first reactive gas;  
    exposing the substrate surface to a second reactive gas;  
    sequentially repeating the exposure to the first and second reactive gases until an adhesion layer having a desired thickness is formed;  
    exposing the substrate surface to a third reactive gas;  
    exposing the substrate surface to a fourth reactive gas; and then  
    sequentially repeating the exposure to the third and fourth reactive gases until a barrier layer having a desired thickness is formed over the adhesion layer.

27. (Withdrawn)                   The method of claim 26, wherein the first reactive gas comprises a refractory metal-containing compound.

28. (Withdrawn)                   The method of claim 27, wherein the refractory metal-containing compound comprises TDMAT, TDEAT,  $\text{TiCl}_4$ , or combinations thereof.

28. (Withdrawn)                   The method of claim 27, wherein the second precursor gas comprises a reducing compound.

29. (Withdrawn)                   The method of claim 28, wherein the reducing compound comprises  $\text{H}_2$ ,  $\text{B}_2\text{H}_6$ ,  $\text{SiH}_4$ ,  $\text{NH}_3$ , or combinations thereof.

30. (Withdrawn)                   The method of claim 27, wherein the third precursor gas comprises a refractory metal-containing compound.

31. (Withdrawn)                   The method of claim 30, wherein the refractory metal-containing compound comprises tungsten.

32. (Withdrawn)                   The method of claim 27, wherein the fourth comprises a reducing compound.